



Office of Research and Development

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**Press
Release**

EPA Study Provides Evidence that Metal Particles May Increase Severity of Asthma

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RESEARCH TRIANGLE PARK, NC...Scientists at the Environmental Protection Agency have identified metals as primary suspects in air pollution which may affect the severity of pre-existing asthma in adults and children. This international study, available online in *Environmental Health Perspectives** is the first to link human and animal data to show the possible role of metals in soot from metal industries and coal combustion in aggravating asthma.

A recent epidemiology study by German scientists found children living in the polluted city of Hettstedt had higher rates of bronchitis and allergic diseases compared to a similar group of children living in the nearby city of Zerbst where air pollution is comparatively lower. Scientists at EPA's National Health and Environmental Effects Research Laboratory in Research Triangle Park, NC, used samples of fine particulate matter (PM_{2.5}) taken from the two German cities to investigate air pollutant components which may cause these symptoms.

In the study, scientists found that the amount of toxic metals in PM_{2.5} from polluted Hettstedt was several times higher than PM_{2.5} from relatively pollution-free Zerbst. Animals prone to allergic asthma had greater lung inflammation and exacerbation of allergic symptoms after exposure to the particles from the heavily polluted city compared to those exposed to particles from the less polluted city.

The results also suggest that exposure to metal-rich particles exacerbate existing asthma, but does not increase the incidence of new asthma. Lung inflammation and function changes occurred when particles were administered to mice with pre-existing allergy, but not when particles were given to mice just before they were made allergic.

In 1998, the EPA and the German GSF (Research Center for Environment and Health) began a collaboration to study problems related to environmental pollutants and their impact on human health. The study is a culmination of this partnership. A major strength of this study is

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that epidemiological and toxicological approaches have been combined to give greater certainty on the health effects of PM_{2.5}.

Allergic asthma is considered an epidemic in the United States and afflicts an estimated 15 million Americans, including about five million children. Since 1980, the biggest growth in asthma cases has occurred in children under five.

The EPA's Asthma Research Strategy identifies and prioritizes the research needed to understand better the environmental factors that contribute to disease. While studies that analyze relationships between medical records of populations and environmental factors have established strong evidence that PM_{2.5} can exacerbate asthma, more toxicological research is needed to identify responsible components for health effects. Metals are under intense investigation as both epidemiology and toxicology studies continue to document evidence of their detrimental health effects.

For more information on EPA's Asthma Research Strategy, visit the Web site:
<http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=54825>.

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*Gavett, S. H., N. Haykal-Coates, L. B. Copeland, J. Heinrich, and M. I. Gilmour. Metal composition of ambient PM_{2.5} influences severity of allergic airways disease in mice. *Environmental Health Perspectives* doi:10.1289/ehp.6300.

Editor's note: A full copy of the report is available by fax or e-mail (PDF format) to media at no charge. Go to www.ehponline.org/press or call 919-653-2583.